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THE OPPORTUNITY OF THE SUGAR CANE INDUSTRY.

BY CHARLES A. CRAMPTON.

THIS country is now confronted with a problem of the greatest difficulty—the assimilation and development of a large extent of tropical territory, inhabited by alien races, and impoverished by ages of misrule, in such a manner as to secure the material prosperity of the new peoples, without endangering in any way the interests of our own citizens. Notwithstanding the fact that this problem has occupied the arena of public debate since the close of the war, calling forth the most diverse ideas from eminent authorities in political economy, the most important point of view has been wholly neglected. The solution of the problem of successful colonial expansion by the United States will be found in the rehabilitation and development of the tropical sugar cane industry.

The United States of America is the largest consumer of sugar in the world, with the single exception of Great Britain. Of the world's total production of seven million tons, we absorb over two million tons, of which only three hundred thousand tons are of domestic production. We send abroad annually over eighty million dollars for this food product, so that it is our largest single item of foreign expenditure. With the hope of diminishing this drain upon our resources, the Government has for many years fostered the domestic production of sugar, and not entirely without success, for the Louisiana industry has greatly improved, and the beet industry, under the encouragement of the Department of Agriculture, has made considerable progress and obtained a firm footing in California. To sorghum sugar we must bid a fond adieu, sad though the parting may be to those of us who spent many years of labor in its behalf.

But the growth of domestic production, for various reasons which we will not now discuss, has been slow and unsatisfactory, and promises little better for the immediate future; the country cannot wait for it, especially as the means are at hand for attaining the end in view in a few years, which could not otherwise be accomplished in as many decades.

The territory of which we have lately come into possession is the natural habitat of the sugar cane. With the exception of Porto Rico, where the value of the coffee crop somewhat exceeds the value of the sugar crop, the principal production of all the new possessions is sugar. Collectively (here, as hereafter in this article, no distinction is made between actual and potential possessions, and the Hawaiian Islands are included with the islands wrested from Spain), they furnish about one-half of the total cane sugar product of the world. The inference is obvious, and the bearing of these facts upon the problem under consideration must be plain to the veriest tyro in national economy. The commodity of which we stand most in need is produced in the greatest abundance in the new possessions; it is only necessary to stimulate the production of sugar in the colonies to the point of supplying our needs, and the entire amount of our expenditure for this food product, instead of going to Germany, Austria and France, as at present, will flow into Cuba, Porto Rico and the Philippines, bringing back the equivalent in trade for our exports.

And this is only the threshold of the inviting prospect now opening up before us. American enterprise will never be content to stop at the production of sufficient raw sugar to supply our home consumption; but it will continue the process of development, until raw sugar shall become an article of export instead of import, and cane sugar shall reassert its supremacy over beet in the markets of the world. In order to understand fully the possibilities of the situation, it will be necessary to take a hasty glance backward over the history of the production of sugar, and especially to consider the past of the two rival agricultural sources, the tropical sugar cane and the European sugar beet.

Sugar is a constituent of most plants, in greater or less degree, at some period of their growth. Its exact position or function in the metabolism of plant tissue is still a matter of theory among chemists, but its wide distribution is becoming more and more evident, as time goes on. Even the cereal grains, formerly sup-

posed to be merely storehouses of starch, have lately been found to contain notable quantities of sucrose or saccharose, the specific name used by chemists to distinguish the substance in question from its congener carbohydrates possessing a sweet taste. The popular name for this substance, however, cane sugar, indicates the plant containing it in sufficient abundance to first attract the attention of mankind. This plant, *saccharum officinarum*, probably originated in Asia, whence it has spread gradually to all tropical regions, its easy propagation from eyes on the cane itself assisting materially in its dissemination. The cultivation of this plant for its sweet qualities stretches far back into the past, "sweet canes" being mentioned in the Hebrew Scriptures, and its use in China probably antedated even this mention; yet the extraction of sugar from its juice, and especially the use of the substance as a separate article of food, is a matter of comparatively recent date. For centuries it was used in Europe only as a confection or as a medicine, and it was not until the beginning of the seventeenth century, a hundred years or more after it was first cultivated in the Eastern hemisphere, that it began to be an article of commerce and was imported to any extent into Europe. Once begun, however, its modern development down to the present day, when it constitutes one of the world's greatest industries, the product of which reaches the consumer for the greater part as a chemically pure article, is little short of marvelous; in truth, its history cannot be surpassed in interest by that of any line of human endeavor.

Of this story of industrial progress, probably the most interesting chapter is furnished by the rise and development of the beet sugar branch of the industry. Until the beginning of the present century the cane reigned supreme as a source of sweetness; then began the first struggles of the lowly beet to make a place for itself in the field wholly occupied by its towering rival. Aided by the lifelong devotion of Marggraf and Achard in Germany, and by the despotic decrees of Napoleon in France, slowly but surely it made its way; until the end of the century finds its proud but indolent superior entirely dethroned, and the once despised beet occupying the coveted position of the leading sugar producing plant in the world. The story of the contest has often been told and need not be entered upon in detail here; yet a repetition might well be forgiven in view of the general ignorance on the subject

in America. How many persons may be met here to-day, men of intelligence and information, who are not even aware of the single pregnant fact that nearly two-thirds of the world's consumption of sugar is obtained from the beet root? This ignorance is due partly, perhaps, to the fact that the industry is practically a foreign one, having obtained a bare foothold as yet in this country, so that its dimensions are not so forced upon public attention here as they are abroad; and it is also largely due to the relatively rapid development of the beet industry. It was not until 1887 that it passed the cane industry in preponderance of production.

If inquiry be made into the causes which have contributed to the remarkable result just indicated, we will find there is no good and sufficient reason for supposing that the present advantage of the beet will be other than a temporary victory, or that the sun of prosperity will never shine again for the tropical plant. The development of the sugar beet industry has proceeded, as is well known, along two distinct but parallel lines, agricultural and mechanical. When first taken in hand by the manufacturer, the root contained only four or five per cent. of sugar, of which but one-half could be extracted as finished product. By the application of scientific methods to its culture, the cross-breeding of varieties and the selection of seed with reference to the sugar content of the mother beet, this amount was raised to an average of 15 or 16 per cent., and modern methods of economical manufacture obtained 13 or 14 per cent. of the weight of the raw material as crystallized sugar.

When we seek for evidence of like progress in the cane branch of the industry, what do we find? In the factory, absolute stagnation and adherence to primitive methods for years, which gave place to action at least only when the industry was threatened with total extinction by the increasing pressure of the beet competition. Even then, the advancement consisted chiefly in the adoption of the improved methods which had been devised and perfected by the beet workers. Not a single important improvement in methods of manufacture is native to the sugar cane branch of the industry. In the field the comparison is still more discreditable. The sugar cane is probably no richer in sugar now than it was in its wild state; at least, there has been no apparent improvement in recent years. Indeed, it is often called, in contempt, "a tropical weed" by the scientific admirers of the European plant. The discovery in Ja-

maica of fertile "arrows" or seeds, and the rearing of new varieties from them, is an indication of possibilities in the future; but it has accomplished nothing as yet, and the same may be said of some promising experiments in Louisiana in the selection of seed cane with reference to sugar content.

Yet the cane is infinitely superior to beet as a sugar producing plant, from both an agricultural and manufacturing standpoint, even in its present undeveloped condition. It can be grown at less expense under the proper climatic conditions, and the sugar content can be obtained at a smaller cost of manufacture; and, while the beet has, probably, almost reached the climax of its development, the margin of possibility in the case of the cane is wide and inviting. By the expenditure upon it of one-tenth of the study and energy which have been devoted to the service of the beet, the cane would soon overtake and outstrip its pudgy rival in the race for supremacy.

The beet owes its present success solely to the fact of its being grown in a temperate climate, where the talents and enterprise of an energetic race can be applied to the problem of its improvement. When the ingenuity and "push" of the American nation are added to the natural advantages possessed by the tropical plant, there will be formed a combination which will indeed prove "hard to beat." Some hint of what we may accomplish when we turn our hand to sugar cane culture may be found in the Hawaiian Islands, where the yield, both in tons per acre and pounds per ton, exceeds that of any other cane growing country. In Louisiana, likewise, the results achieved are remarkable in many respects, when the great obstacle of climate is taken into consideration. The question of the relative merits of the two plants has also another side which is worthy of consideration. There is something very persistent and repulsive about the natural taste and odor of raw beet sugar. It is "of the earth, earthy," and even the refined product often retains traces of this, as will be manifest to any one who will try the simple experiment of opening a can or close receptacle containing beet granulated. Raw cane sugar, on the other hand, has a most agreeable flavor, second only to that "confection of nature," maple sugar, as will be readily conceded by those among our readers whose memory goes back to the days of hogshead sugar from Louisiana or the West Indies. Raw beet sugar absolutely requires refining to fit it for use, while raw cane sugar is

perfectly palatable, and should be used much more than it is. Some day, perhaps, the present vogue for the hard granulated article may change, and the laboring classes, at least, become more sensible and decide to use, instead, high grade raw cane sugar, such as is produced on the plantations in Louisiana, and which is practically identical with the granulated article except for a slight tinge of color, the removal of which furnishes our refineries their immense profits. Brown refining sugars, however, are a delusion and a snare for the consumer, as they contain a large amount of water, and often as much raw beet sugar as can be masked by the cane flavor.

The official report of a disinterested observer, the British Consul-General at Havana, Mr. Gollam, on the sugar producing capacity of Cuba, is worthy of consideration.* After giving statistics which show the ruin wrought to the industry by the war, reducing the output from a million tons in 1895 to a pitiful two hundred thousand tons in 1896, he says:

"Cuba in normal times may be said to be one of the most favored countries of the world for the economical production of sugar. The present condition of affairs greatly burdens the sugar industry, owing to the necessity of protecting the estates, the loss of cane through incendiary fires, and the difficulty at times of getting enough hauled to the works to use them to their full capacity.

"Under normal conditions, the contrast between the Cuban industry and that of other West Indian Islands, or any American sugar-producing country, is remarkable. The total sugar crop of any other island is equal only to the output of three or four of the largest Cuban manufactories, and, with the exception of Demerara, all these countries show considerable inferiority to Cuba in methods of manufacture and in the class of machinery in use. The neglect of the other West Indian planters to advance with the times is the main cause of this lack of prosperity at the present moment. Of the other cane-sugar countries of the world, Java is the only one which comes within 50 per cent. of the amount of sugar produced annually in Cuba in normal times, and Java and the Hawaiian Islands are the only ones which are generally advanced in the process of manufacture.

"Until a very recent date the manufacture of sugar and the growing of cane in Cuba were extremely profitable undertakings, and the reasons for their prosperity may be stated as:

"1. The excellence of the climate and the fertility of the soil, which allow of large crops of good cane. The rainfall, about 50 inches, is so distributed that irrigation is not a necessity, though it would in many cases be advisable.

"2. The great movement toward the centralization of the estates which took place in the early eighties; planters have understood the value of large sugar houses and overcome their difficulty in this way.

"3. The proximity of the United States, affording, as it does, a cash market for the sugar.

*Foreign Office Annual Series, No. 1880, 1897.

"In spite of the above advantages, the size of the sugar crop is a surprise to many, while elsewhere the industry must be fostered by bounties. The agricultural adaptability of the country, however, counts for much; the cost of labor is low, and the sugar houses have a larger daily capacity than those of any other country."

We may now pass to the consideration of the ways and means by which the desired end, the rehabilitation of the cane sugar industry, may best be promoted and accomplished. The first and foremost step should be the granting of some measure of protection to colonial sugar, in the shape of a discrimination in favor of its importation. This is absolutely essential to any scheme of development, and must not be objected to on the ground of its being political, and therefore artificial, aid. Fire must be fought with fire, and sugar has been entangled with politics from the time of the first Napoleon down to the present day. It is from her inability to adopt such methods, on account of her free trade policy, that England's sugar producing colonies have fared so ill, as evidenced by Jamaica's half expressed threat to knock at our portals for admission. We have already made the precedent in recent tariff acts by discriminating against bounty-fed sugar. This is the thorn which is rankling in Germany's side, and which is well known to be the chief cause of her unfriendly attitude toward us of late years. Cane sugar already enjoys the benefit derived from the discriminating section of the present tariff just mentioned, by virtue of which beet sugar pays an additional duty equal to the bounty it has received from the country of production. An additional protection, in the shape of a colonial differential of half a cent a pound for a limited period, would be no more than fair for the new possessions, and would still leave an ample margin for the protection of domestic growers in our own country. Hawaii should, of course, be placed upon exactly the same basis as the other colonies.

Next in importance comes the establishment of an agricultural experiment station in each of the colonies, to study the special problems of soil, climate and cultivation presented there, and all to combine in the scientific improvement of the plant. Local conditions, pertaining to the cost of labor and of land, density of population, transportation facilities, etc., will determine the best plan to pursue in each case; whether the wholesale agricultural methods of the West shall be used to produce a heavy yield at a low cost, or whether the careful and painstaking methods of Eu-

rope, with the practical divorce of the grower and manufacturer, would give best results in the end; but many other questions of development can be determined only by a careful comparison of results obtained under diverse conditions. If the initiatory assistance of the Government be given to the extent indicated above, a half cent difference in duty and the establishment of agricultural experiment stations, the further solution of the problem may safely be left to American capital and enterprise. The talent for invention, which seems to be the birthright of the American manufacturer, may be relied upon to overcome in time the temporary handicap which the careful and economical methods of the beet technologist have given him.

It may not be considered as too wide a digression from the subject to say a few words in closing upon the subordinate problem of the retention of the Philippines. The bearing of the proposed solution of the sugar question upon the minor problem is obvious, and it is highly important that it should receive consideration at the hands of the Congress, upon whom rests the responsibility of its settlement. At first sight, it would seem that the influence of the sugar expansionist would all be cast upon the affirmative side of the argument. The Philippine Islands enjoy excellent advantages in respect to climate, soil, etc., for the growing of cane, yet, of all the raw cane sugar product of the world that comes to the refineries their's is probably the crudest and worst; their methods, both of culture and of manufacture, are the most primitive. They offer, therefore, the greatest margin for development, and would seem to be the most attractive field of operations on this account. But they are so far removed from our shores, the conditions of living, of labor and of transportation are so inimical, that the possibilities of development are nearly, if not quite, overbalanced. Internal discord and civil war are disastrous to any industry, but doubly fatal to the sugar industry, as is evidenced by Cuba's present condition. This arises, of course, from the nature of the work, which requires the erection of costly machinery in places remote from the centers of population, where they are at the mercy of the outlaw and guerrilla. No country, however great its natural advantages, can offer a fitting home to modern sugar making, unless it is able to guarantee absolutely permanent peace.

Another point to be considered is the high degree of special

training required of the superintendents, engineers and many of the employes in the factories. A large number of such specialists cannot be obtained at once, and the rate of development of the industry will probably be more retarded by this difficulty than by any other single cause. It would be the part of wisdom, therefore, to concentrate our energies upon the West Indies, which are right at our doors, rather than to waste effort by spreading it out over so large an extent of distant territory. The proposed exchange of the Philippines for the British West Indies would be a most admirable settlement of the problem from a sugar producing standpoint, and is certainly not without its advantages in other respects. It is all the more a matter of surprise that the misguided and shortsighted natives should assume an attitude of hostility to American domination, whether permanent or temporary. The future prosperity of their country depends upon the development of their chief industry, which they may soon accomplish as America's ally—never as her rival.

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